

Programmable Logic Controllers ITAG: Documentation of Credential and Alignment

Credential Name:	Siemens SCE Certificate in Automation and Certificate in Advanced Automation Rockwell Automation Studio 5000 Logix Programmer Certificate Mitsubishi Electric PLC & HMI
Credential Type:	X Certification <input type="checkbox"/> License
Issuer of Credential:	Siemens; Rockwell Automation; Mitsubishi
Frequency of Updates:	
Exam(s) Required:	<p>Siemens SCE Certificate in Automation and Certificate in Advanced Automation: SCE Automation Fundamentals Certification Test for Students: PLC (all 3 parts) SCE Advanced Automation Fundamentals Certification Test for Students: PLC (all 5 parts) https://new.siemens.com/us/en/products/automation/systems/sce/certificates.html</p> <p>Rockwell Automation Studio 5000 Logix Programming Certificate: Logix Programmer Assessment (upon completion of the four courses in the curriculum) https://literature.rockwellautomation.com/idc/groups/multi_media/documents/multimedia/files/virtualbrochure/training-catalog/certificate-programs/logix-programmer/traditional-path</p> <p>Mitsubishi Electric PLC & HMI An overview of the program and exam, along with proprietary sample materials from the credentialing exam, have been made available for ITAG reviewers here: https://drive.google.com/drive/folders/1kc32kBBIDIRQUNZBj23EwEHxpa79D5b?usp=sharing</p>
Additional Requirements:	N/A
Current CTAG/TAG: (if applicable)	<p>TAG (OET022): https://www.ohiohighered.org/sites/ohiohighered.org/files/uploads/transfer/document%20s/TAG/FINAL%20Learning%20Outcomes%20for%20Programmable%20Logic%20Controllers%205-31-17.pdf</p>
Description of content to be evaluated and aligned:	
How long after attainment can credit be awarded?	2 Years
How can receiving institutions verify credential attainment?	Student must provide proof of certification.

Course Name: Programmable Logic Controllers

Credit Hours: 3

Course Description: This course includes the principles and application of Programmable Logic Controllers including ladder logic, program control, data manipulation, math instructions, sequencers, shift registers, networking, PLC-mechanism interfacing and human-machine interfacing. Students will install, program, and document PLCs used in a variety of applications. The course will include advanced control circuits, advanced design of ladder and wiring diagrams to meet a given set of criteria, PLC programming, development of a human-machine interface, and data transfer in PLC networks. Must include hands-on labs.

Postsecondary Learning Outcomes	Credential Content: Siemens SCE Certificate in Automation and Certificate in Advanced Automation	Credential Content: Rockwell Automation Studio 5000 Logix Programmer Certificate	Credential Content: Mitsubishi Electric PLC & HMI
1. Recall the history of control systems and programmable logic controllers (PLCs).*	Identify the major components of a PLC and describe their functions	Basic Programming	Understand and establish basic knowledge of PLC programming for Mitsubishi PLCs
2. Explain and describe the use of number systems.*	Data types; A to D conversion	Basic Programming	Be able to perform basic PLC operations Become familiar with Mitsubishi PLC software GXWorks2 (how to connect to a plc system directly, via a HMI, via a network). Learn how to create/modify, monitor and save programs. Troubleshoot Mitsubishi PLC's
3. Demonstrate the use of ladder logic programming devices.*	Read a basic ladder logic diagram and statement list	Basic Programming	Be able to perform basic PLC operations Become familiar with Mitsubishi PLC software GXWorks2 (how to connect to a plc system directly, via a HMI, via a network). Learn how to create/modify, monitor and save programs.

			Troubleshoot Mitsubishi PLC's
4. Employ ladder logic in control circuit design.*	Read a basic ladder logic diagram and statement list	Basic Programming	Be able to perform basic PLC operations Become familiar with Mitsubishi PLC software GXWorks2 (how to connect to a plc system directly, via a HMI, via a network). Learn how to create/modify, monitor and save programs. Troubleshoot Mitsubishi PLC's
5. Use addressing to control Input/Output (I/O) modules.*	Connect a simple discrete input and output to an S7-200 Select the proper expansion module for analog inputs and outputs	Allen Bradley Structured Text Programming	Understand and establish basic knowledge of PLC programming for Mitsubishi PLCs
6. Demonstrate the use of relays, contacts, coils, and timers.*	Describe the operation of timers and counters	Allen Bradley Sequential Function Chart Programming:	Be able to create plc programs using many advanced functions (counters, timers, data registers, mov commands, comparisons, arithmetic instructions, master control)
7. Demonstrate counters and sequencers.*	Describe the operation of timers and counters	Allen Bradley Function Block Programming:	Be able to create plc programs using many advanced functions (counters, timers, data registers, mov commands, comparisons, arithmetic instructions, master control)
8. Demonstrate fundamental PLC programming (e.g., comparators, block transfers, I/O forcing).*	Basic network communications between PLCs, HMIs, and distributed IO	Allen Bradley Function Block Programming:	Be able to design screens on HMI (push buttons, lights, numerical display and

			input, templates, simple animation)
9. Demonstrate data transfer in PLC networks.*	Basic network communications between PLCs, HMIs, and distributed IO	Allen Bradley Sequential Function Chart Programming:	Be able to connect HMI to PLC (serial, Ethernet, bus)